

## The St. Luke's Research and Biotechnology Division: A Modern Biomedical Research Facility in the Philippines

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### INTRODUCTION

Philippine medical science took a giant step forward with the establishment of the Research and Biotechnology Division (RBD) of St. Luke's Medical Center (SLMC) in July 1995. It was a bold and pioneering step that ushered in a new era for SLMC, the most progressive private hospital in the Philippines.

As the first director of the division, I faced the task of building what is to be the most modern biomedical research facility in the whole country. It was not only a herculean task, but an extraordinary one. It was not only building a physical infrastructure. It meant building a partnership between basic scientists and clinicians. It meant bringing the promise and challenge of pioneering biomedical research on a wide variety of medical problems. It meant providing the proper atmosphere for a new culture of science that would propel St. Luke's into the realm of world-class medical centers.

#### Profile of RBD Research Staff as of August 1998

Position	Number
Research Scientists	
Full Time	3 (1 Ph.D., 2 MS)
Part Time	6 (5 Ph.D., 1 MS)
Adjunct Researchers	19 (M.D.'s)
Clinical Epidemiologists	3 (M.D.'s)
Research Fellows	5 (M.D.'s)
Chemist	1
Technical Assistants	14
Data Assistant	1
Research Nurses	3
Laboratory Technicians	3
Trainees	5

Three years after its inauguration, RBD complements the excellent medical setting at SLMC with its advanced laboratories, specialized service facilities, and international linkages. Through its facilities and activities, RBD provides opportunities for basic research, hastens the development of research-oriented physicians, and promotes international partnerships that will enhance the medical profession in intangible, yet profound ways. The profile of the research staff and a current summary of research areas are shown in the accompanying tables.

#### Profile of RBD Research Projects

Area of Research	Number
Cancer Research	6
Hematology	1
Obstetrics and Gynecology	3
Clinical Epidemiology	4
Microbiology	2
Emerging and Re-Emerging Diseases	3
Metabolic Research	1
Neuroscience	3
Geriatrics	2
Environmental Research	2
Cardiac Research	1
Nutrition	1
Pediatrics	2

#### Advanced Laboratories

All research laboratories at RBD are fully-equipped for advanced biomedical research. Facilities for DNA isolation and analysis, protein isolation, purification and quantitation, cell culture and cryopreservation, advanced microscopy, darkroom facilities and animal studies, among others, are available for in-house research projects.

- The DNA Laboratory conducts molecular diagnostic protocols, such as RT-PCR of marker genes for diseases on clinical samples. The state-of-the-art equipment include an ALF DNA Sequencer, Ecosyn DNA Synthesizer, thermocyclers, several mini-gel electrophoresis systems, and DNA documentation equipment. Polymerase chain reaction is used in research projects on the Dengue virus, the Human Papilloma virus, Hepatitis C Virus, Tuberculosis, and several research projects on cancer.
- The RECOMBINANT DNA LABORATORY applies genetic engineering techniques to produce bacterial clones containing recombinant genes. The genes are then sequenced

- to determine genotypes or to detect presence of mutations.
- The PROTEIN LABORATORY employs cutting-edge molecular techniques, such as column chromatography, isoelectric focusing, SDS-Polyacrylamide Gel Electrophoresis and immunoblotting to extract and purify recombinant gene proteins and other gene products. Currently, expression studies on the NSI protein of Philippine Dengue 3 isolates produced from recombinant plasmids are being undertaken.
  - The MICROBIOLOGY LABORATORY offers services on the culture, isolation, purification and identification of pathogenic and non-pathogenic microorganisms. It is also involved in clinical trials that involve culture, identification and sensitivity testing of microorganisms. It has isolated and characterized four Philippine isolates of *Helicobacter pylori* from patients with duodenal ulcers. This unit is equipped with a P2 biohazard facility for handling pathogenic microorganisms and a P3 lab for the study on *Mycobacterium tuberculosis*.
  - Three (3) CELL CULTURE LABORATORIES are fully equipped for basic culturing techniques and special procedures including cell banking, in vitro research, virus propagation, cancer studies and other cell biology research. The aseptic environment is maintained by HEPA filters and an interlocking door system to provide an aseptic barrier for the culture environment. A Class 3 cell culture facility is available for the culture of infectious agents such as virus-producing cell lines, and tissues and cells infected with known human pathogens.
  - The ANIMAL FACILITY maintains experimental animals such as mice, guinea pigs, rabbits, and other medium-sized animals for experimentation as needed. At present breeding of Balb/c mice is going on for future work on the production of monoclonal antibodies, and for immunological research. The facility is also equipped with 2 operating theaters and recovery and quarantine rooms.

### Specialized Service Facilities

- One of the few laboratories in the Philippines with complete facilities and well-trained staff for chromosomal analysis, the CYTOGENETICS LABORATORY promises to be at the forefront of the application of genetics in medical diagnosis. It can perform G and Q banding as well as high-resolution banding in the identification, screening and diagnosis of chromosome anomalies. It is both a service lab as well as a research lab.
- To cope with rapid technical advances in the field of medical science, SLMC opened its ELECTRON MICROSCOPE FACILITY in July 1996. A joint undertaking of RBD and the Institute of Pathology, the EM Facility is equipped with a JEOL Transmission Electron Microscope (JEM 1010), an RMC Ultra-microtome, a fully equipped processing laboratory, and darkroom facilities. It offers diagnostic services for clinicians as well as technical services for researchers from academic institutions and industry.
- The HPLC ANALYTICAL LABORATORY aims to develop HPLC methodologies for clinical analyses. It performs separation and quantitative determination of drugs and metabolites in biological samples like blood and urine. Initially, the facility was set up

to provide services for the determination of cyclosporin levels in transplant patients. Soon, a gas chromatograph-mass spectrometer (GC-MS) will be added to its facilities for dangerous drugs analysis.

### **International Linkages**

Linkages with foreign medical research institutes have expanded the research orientations of the division. The research staff has availed of training opportunities at LDS Hospital in Utah, Henry Ford Health Sciences Center in Detroit, Michigan, National Institute of Health, Japan, Institute of Tropical Medicine of Nagasaki University, and the National Cardiovascular Center Research Institute, Osaka University. Our international research collaborations include a clinical study on ovarian cancer with M.D. Anderson Cancer Center in Houston, Texas, and the Dengue Research Project with the WHO Collaborating Center for Reference and Research on Tropical Virus Diseases, Centers for Disease Control (CDC) in the US. A Cooperative Agreement has been signed with CDC to give assurance for the protection of human subjects in cooperative protocol research programs. In addition, discussions are currently ongoing for a research collaboration with Georgetown University.

### **A New Beginning, A New Partnership**

In line with its vision and mission of providing the country the best health care services, SL Luke's Medical Center opens the doors of its modern research laboratories at RBD. Even as SLMC vows to maintain its high standards of health care and efficient hospital management, it now aspires to be a unique medical institution by being more than just a first class hospital. In partnership with Filipino and international scientists, SLMC brings the promise and challenge of pioneering biomedical research on a wide variety of medical problems. Its research laboratories have been organized and geared toward world-class status, with the capability to conduct biomedical researches that are relevant as well as socially responsive.

Envisioning itself as a catalyst or prime mover in research, SLMC welcomes local and foreign researches to avail of its modern research facilities and scholarly ambience in collaborating with its research staff. To complement studies made by Philippine-based research institutions, SLMC aims to produce scientific articles worthy of international publications. SLMC offers its willing partners the opportunities to do research. All these are ultimately in keeping with the RBD vision "to promote the conduct of high quality biomedical research that will propel St. Luke's Medical Center to the realm of world class excellence in total health care".